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Sound Insulation Studio

NS-SIS

INTRODUCTION

Sound Insulation Studio is the professional platform for the analysis and verification of acoustic performance in buildings, designed to meet the needs of **engineering firms, public administrations, accredited laboratories, and construction companies.**

Based on international standards **ISO 16283** (in-situ measurements) and **ISO 10140** (laboratory tests), it allows you to:

- Assess the **sound insulation of walls, floors, and façades;**
- Analyze **impact noise** and **noise generated by service equipments in buildings;**
- Compare results with **legal limits** (Customizable limits or D.P.C.M. 5/12/97, UNI 11367, CAM);
- Manage **measurement reports of housing units and building materials;**
- Generate **clear and customizable** reports, ready for design, testing, or certification.

With its intuitive interface, constant regulatory updates, and advanced calculation tools, **Sound Insulation Studio** is the ideal solution for professionals who want to ensure quality, compliance, and reliability in their consulting services.

USES

- Analysis of passive acoustic requirements of buildings
- Sound insulation of horizontal and vertical partitions
- Impact sound pressure level
- Façade sound insulation
- Noise from continuous and discontinuous building services

FEATURES

Measurement data management

Recognition of tags from XPT800 sound level meters and automatic identification of the measurement type (Source, Receiver, Background, Reverberation Time, Impact Noise). Recognition of the sound source position. Thanks to tagging, handling large volumes of measurements becomes simple and intuitive, boosting productivity.

Project structure

Dividing the project into Housing Units / Rooms / Partitions or Service Equipment allows logical and orderly management of measurements and analyses. The building structure is fully editable, enabling modifications, additions, or removal of spaces and partitions at any time.

Floor plan import

The building layout, including housing units, rooms, and partitions under analysis, can be represented by importing the floor plan. An automatic function visually identifies the space under study, assisting the user especially in the case of complex buildings.

INTUITIVE USER INTERFACE
User-friendly software with clear workflows and instant visualization of results.

HARDWARE-SOFTWARE INTEGRATION
Direct connection and full compatibility with XPT800 analyzers.

DATA MANAGEMENT
Structured storage and easy access to historical data, with functions for comparing measurements.

CUSTOMIZATION AND REPORTING
Creation of comprehensive reports with a professional layout, ready for delivery to clients or certification bodies. Option to customize classifications and related limits according to the specific requirements of the project or local regulations.

REGULATORY SUPPORT AND UPDATES
Regular updates to include new standards or measurement methods.

Making the unknown, known

FEATURES

- **Automatic recognition** of the type of signal used (interrupted source or impulsive source) and option to calculate the Schröder integral.
- **Processing of sound decays and calculation of T60**: imported decay curves from sound level measurements can be displayed graphically. Calculated reverberation times (EDT, T10, T20, T30, T60, Tbest) can be further processed if needed.
- **Multi-decay view**: overview of decay curves for each frequency band for faster understanding of acoustic phenomena.
- **Reverberation quality indicators** according to ISO 3382:

  BT (Bandwidth × T60)
  BK (Background)
  Co (Correlation)
  Cu (Curvature)
  SD (Standard Deviation)
  NL (Non-linearity)

- **Automated reporting** in compliance with ISO 717 requirements. Export available in Word and PDF, with customizable templates.
- Export excel

CALCULATED INDICES

ON-SITE R'_w - $D_{nT,w}$ - $L'_{n,w}$ - $L'_{nT,w}$ - $R'_{45°,w}$ - $R'_{tr,s,w}$ - $D_{ls,2m,n,w}$ - $D_{tr,2m,n,w}$ - $D_{tr,2m,nT,w}$ - $D_{ls,2m,nT,w}$ - L_{XYmax} - $L_{XYmax,nT}$ - $L_{XYmax,n}$ - L_{Xeq} - $L_{Xeq,nT}$

LABORATORY R_w - $D_{n,e,w}$ - $L_{n,w}$ - $D_{n,w}$

STANDARDS

Application		Type		Standard	
LABORATORY	Airborne sound insulation	ISO 10140-2:2021	Laboratory measurement of sound insulation of building elements – Part 2: Measurement of airborne sound insulation		
	Impact sound insulation	ISO 10140-3:2021	Laboratory measurement of sound insulation of building elements – Part 3: Measurement of impact sound insulation		
ON FIELD	Airborne sound insulation	ISO 16283-1:2014	Field measurement of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation		
	Impact sound insulation	ISO 16283-2:2020	Field measurement of sound insulation in buildings and of building elements – Part 2: Impact sound insulation		
	Façade sound insulation	ISO 16283-3:2016	Field measurement of sound insulation in buildings and of building elements – Part 3: Façade sound insulation		
	Building service equipments noise	EN ISO 10052:2021	Field measurements of airborne and impact sound insulation and service equipments noise – Control method		
	Building service equipments noise	EN ISO 16032:2024	Measurement of sound pressure level from building service equipment or activities – Engineering method		

ISO 717-1:2021 Evaluation of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation

ISO 717-2:2021 Evaluation of sound insulation in buildings and of building elements – Part 2: Impact sound insulation

ISO 3382-2:2008 Measurement of room acoustic parameters – Part 2: Reverberation time in ordinary rooms

GENERAL FEATURES

Compatibility Sound Level Meters XPT800, HD2110L, HD2010UC/A

Languages Italian, English (other languages planned)

Help Context-sensitive online guide in English and Italian – Keyboard shortcut commands

Hardware Operating System
Windows® 10 (32-bit / 64-bit) or higher
.net Framework 4.7.2

Recommended PC
Intel® Core™ i7
16 GB RAM
Scound Card
At least one USB port
Minimum video resolution 1920x1080 px

Ordering code NS-SIS

APPLICATION

Building acoustics deals with the assessment of the acoustic performance of buildings, with reference to airborne and impact sound insulation, both between indoor spaces and towards the exterior, as well as the control of noise from service equipments.

The analysis of passive acoustic requirements is based on technical regulations such as **the relevant UNI EN ISO** standards. Starting from in-situ measurements, the prescribed acoustic indices are calculated and compliance with legal limits is verified, providing tools for technical documentation and acoustic diagnosis in the building sector.

VISUALIZATION

Project Structure

The hierarchical subdivision into Housing Units, Rooms, Partitions, and Service Equipments enables a structured and systematic management of all stages of the acoustic analysis process. This modular organization facilitates the association of measurements, calculations, and processing with each building element, improving operational efficiency and data traceability.
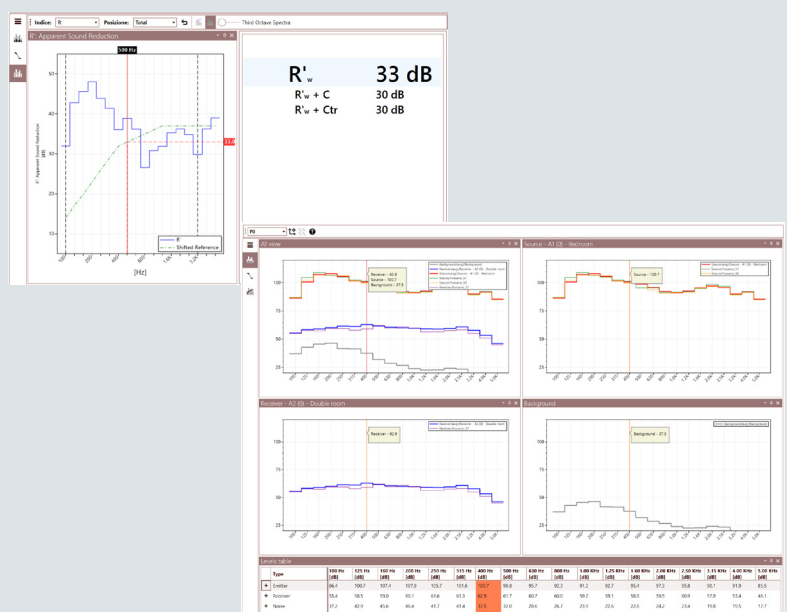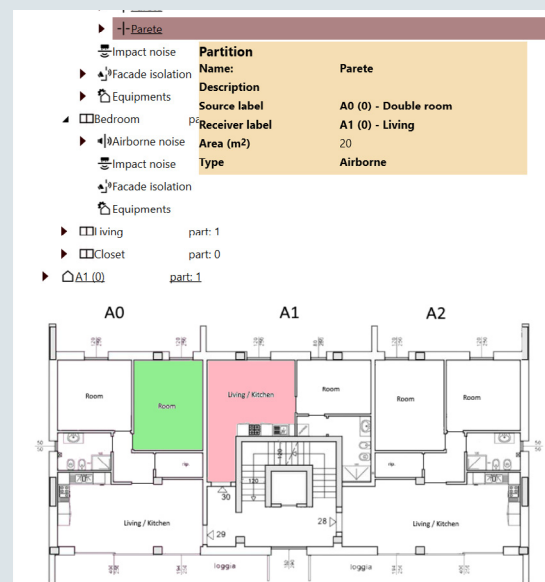
The building structure is fully editable: users can add, modify, or remove spaces and partitions at any time, ensuring maximum flexibility in modeling and updating the housing unit model. An advanced floor plan import function also allows visual association of data with their physical locations within the housing unit, making it easier to interpret results and maintain consistency between the analytical model and the actual configuration.
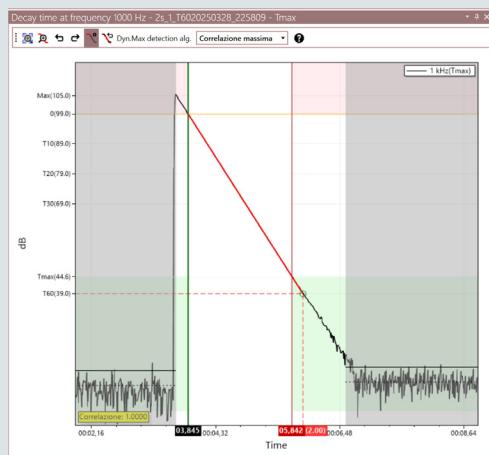

Analysis Window

The main analysis window is the workspace where graphical and numerical visualizations of **Emission, Reception, and Background Noise** spectra are collected. Both the spectra of individual measurements and the averaged spectra from selected measurements are displayed simultaneously.

The selection of measurements to be included in the calculations is interactive, and results are updated in real time, enabling immediate and dynamic analysis of the acquired data.

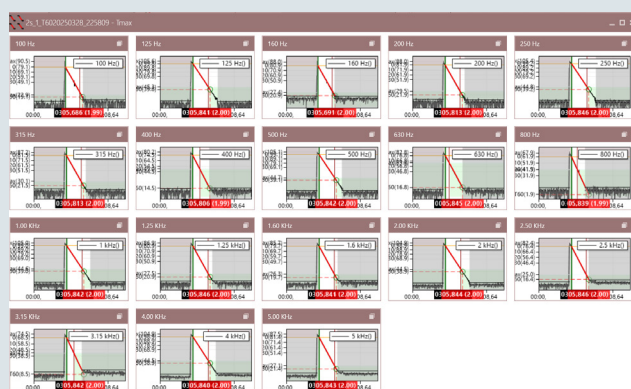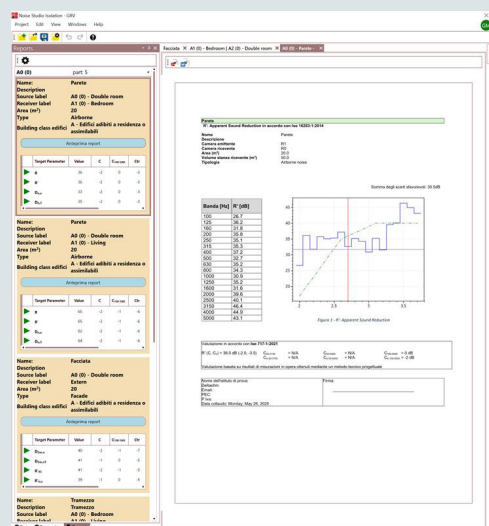The calculation of the selected index (R'_w , $L'_{nT,w}$ ecc.) is instantly available.

Decay Editing

Reverberation Quality Indicators (ISO 3382)

Multi-Decay Views

Final Report

Decay Editing

The decay editing function enables a detailed analysis of the calculated T60 values. By manually or automatically adjusting the cursors, it is possible to define the regression interval, on which the best-fit decay line is calculated.

A proprietary algorithm optimizes either the linear correlation, the available dynamic range, or both, depending on the selected criteria, ensuring greater reliability in the estimation of reverberation time.

Reverberation Quality Indicators (ISO 3382)

The decay editing function is supported by a graphical representation of the quality of the calculated values, in accordance with the criteria defined by ISO 3382 for each one-third octave band. Any modification made to the decay curves triggers an immediate recalculation of the acoustic indicators, providing the user with real-time feedback on the accuracy and reliability of the analysis.

- BT – Product of bandwidth and reverberation time T60.
- BK – Background noise level, which may affect measurements.
- Co – Correlation between signals, useful for evaluating the consistency of the acoustic response.
- Cu – Curvature of the decay curve, highlighting possible anomalies.
- SD – Standard deviation of T60, indicating spatial or spectral variability.
- NL – Non-linearity of the decay, useful for identifying reflections or errors.

Multi-Decay Views

The analysis of reverberation time measurement results is a complex process that can be time-consuming and challenging to interpret. Instrumentally acquired decay curves may show irregularities caused by complex acoustic phenomena, such as standing wave resonances, multiple slopes, or insufficient dynamic range.

In this context, the simultaneous visualization of decay curves across all one-third octave bands proves particularly useful for more easily identifying anomalous or non-representative behaviors. The multi-decay representation therefore serves as an effective support tool for analysis, enhancing the reliability of evaluations and optimizing the acoustic diagnosis process.

Final Report

Sound Insulation Studio automatically generates detailed charts and complete report layouts, designed to be immediately ready for delivery to clients or certification bodies.

The automated reporting function is based on the criteria of ISO 717, ensuring results that comply with international standards. Reports can be exported in Word or PDF format and are fully customizable through editable templates. Charts, tables, and results are automatically integrated into the layout, providing a professional and accurate output without the need for manual adjustments.

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